

Executive Order G-70-163-AA

Exhibit 2

Specifications for the VaporEZ Bootless Nozzle System

Figure 2A depicts the location of component parts of the VaporEZ system. Figures 2B-1 through 2B-4 contain drawings of a typical installation of the VaporEZ system.

Nozzles

1. An efficiency compliance device (ECD) shall be installed on the nozzle at the base of the spout, as shown in Figure 1A. Any nozzle with an ECD which is missing, or which is damaged such that at least one-eighth (1/8) of the diameter is missing, or which has cumulative damage equivalent to at least 1/8 of the diameter missing, is defective and shall be immediately removed from service.
2. Failure mode testing demonstrated that blockage of some of the vapor collection holes in the spout has negligible effect on the operation of the system until only three holes remain unblocked. Any nozzle which is found to have less than three unobstructed vapor collection holes is defective and shall be immediately removed from service.
3. The OPW 11VAI nozzle has an integral vapor valve which prevents the loss of vapor from the underground storage tanks and ensures proper operation of the system. Any nozzle with a defective vapor valve shall be immediately removed from service and the vapor path shall be closed as soon as practicable.
4. Nozzles shall be 100 percent performance checked at the factory, including checks of all shutoff mechanisms and of the integrity of the vapor path. The maximum allowable leak rate for the nozzle shall not exceed the following:

0.038 CFH at a pressure of two inches water column (2" wc), and
0.005 CFH at a vacuum of twenty seven inches water column (approx. 1 psi).

No sealing of the vapor holes on the nozzle spout (such as placing a balloon or the fingers of a glove over the holes) is permitted during static pressure decay tests.

5. Leaded and unleaded spouts are interchangeable.

Inverted Coaxial Hoses

1. The length of hose which may be in contact with the island and/or ground when the nozzle is properly mounted on the dispenser is limited to six inches (6").
2. The hose configuration shall comply with Figure 1C. Within the constraints of the configurations, the maximum allowable length of the hose shall be fifteen feet (15').

Breakaway Couplings

1. Breakaway couplings are optional but, if installed, only CARB certified breakaways which close the vapor path may be used.

VaporEZ System

1. One Blackmer model VRFO pump shall be installed for each dispensing nozzle.
2. The pump shall be installed, at a minimum, in accordance with the instructions of the manufacturer. An optional 90 degree pump manifold may be installed within the dispenser. The pump ID number as listed in Figure 1B will identify if the pump manifold is installed. Any modification of the dispenser piping must be made in accordance with the instructions of the dispenser manufacturer. The pump may be retrofitted on a dispenser which has vapor recovery capability (Vapor Ready) or on a dispenser which needs to be modified to become vapor recovery compatible (Vapor Adapted/Non-Vapor Ready). See Figure 2A. As required by the State Fire Marshal's certification, the VaporEZ system may convert existing vapor-ready, vapor-adapted, and non-vapor-ready systems to vapor assist systems. Where existing Vapor Adapted/Non-Vapor Ready systems are not provided with a poppetted vapor shear valve, an OPW 60 VP or other poppetted vapor shear valve which has been CARB certified and approved by The State Fire Marshal's Office for use on the vapor return line, shall be installed in accordance with the manufacturer's instructions.
3. The pump shall be serviced only by a qualified contractor. Field service of the pump is prohibited.
4. The pump makes an audible clicking sound when operating normally. The clicking sound may be masked by background noise.
5. The normal operating range of the system, as measured by air-to-liquid (A/L) ratio testing, is 1.00, plus or minus 0.10 (0.90 to 1.10). The A/L ratio of the system shall be measured at a flowrate between seven and ten gallons per minute (7 - 10 gpm). The measurements shall be taken not including the nozzle aspirator port. Any fueling point not capable of demonstrating compliance with this performance standard shall be deemed defective and removed from service. The A/L ratio shall be determined by the CARB-approved (TP-201.5) or district-approved test procedure. Alternative test procedures may be used if they are determined by the Executive Officer to yield comparable results.

It is recommended that the aspirator contribution be excluded because this volume is injected into the product stream and does not go through the vapor pump. When the A/L ratio measurements include the aspirator, the allowable range shifts upward (increases) by the following amounts:

<u>Flowrate (gpm)</u>	<u>A/L Ratio Increase</u>
6.0	0.11
8.0	0.10
10.0	0.09

NOTE: This test procedure returns air rather than vapor to the storage tank, and normally causes an increase in storage tank pressure which may result in vent emissions. This is a temporary condition due to the test and should not be considered an indication of malfunction or noncompliance.

Pressure/Vacuum Valves for Storage Tank Vents

1. A pressure/vacuum (P/V) valve shall be installed on each tank vent. Vent lines may be manifolded to minimize the number of P/V valves and potential leak sources, provided the manifold is installed at a height not less than 12 feet above the driveway surface used for Phase I tank truck filling operations. At least one P/V valve shall be installed on manifolded vents. If two P/V valves are desired, they shall be installed in parallel, so that each can serve as a backup for the other if one should fail to open properly. The P/V valve shall be a CARB-certified valve as specified in Exhibit 1. The outlets shall vent upward and be located to eliminate the possibility of vapor accumulating or traveling to a source of ignition or entering adjacent buildings.

Vapor Recovery Piping Configurations

1. The recommended maximum pressure drop through the system, measured at a flow rate of 60 SCFH with dry Nitrogen gas, is 0.02 inches water column (0.03 inches wc at 60 SCFH if the measurement includes an impact valve). The maximum allowable pressure drop through the system shall never exceed one-half inch (0.5") water column at 60 SCFH. The pressure drop shall be measured from the dispenser riser to the UST with the pressure/vacuum valves installed and with the poppeted Phase I vapor connection open.
2. All vapor return lines shall slope a minimum of 1/8 inch per foot. A slope of 1/4 inch or more per foot is recommended wherever feasible.
3. The dispenser shall be connected to the riser with either flexible or rigid material which is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank. The internal diameter of the connector, including all fittings, shall not be less than three-fourths inch (3/4").
4. The recommended nominal inside diameter of the underground Phase II plumbing is as indicated in Figures 2B-1 through 2B-4. Smaller vapor lines are not recommended but may be used provided the pressure drop criteria specified above are met. The vapor return lines shall be manifolded as shown in Figures 2B-1 through 2B-4.

EXCEPTION: For installations with a vapor return line directly to only one tank, and for which a manifold on the tank vents will be used to provide part of the vapor return path to other tanks, the vent manifold may be used as an alternative to the underground manifold only in existing installations where the vapor piping is already installed, and shall not be used in "new" installations where vapor piping is being installed. For installations with dedicated vapor piping directly to each tank, the vent manifold is approved for both new and existing installations and an additional tank manifold below grade is optional but not required.

5. All vapor return and vent piping shall be installed in accordance with the manufacturer's instructions and all applicable regulations.
6. No product shall be dispensed from any fueling point associated with a vapor line which is disconnected and open to the atmosphere. If vapor lines are manifolded, this includes all fueling points in the facility.

Phase I System

WARNING: Phase I fill caps should be opened with caution because the storage tank may be under pressure.

1. The local district may require the installation of a threaded tap at least 1/8" in diameter at which the underground storage tank (UST) pressure may be monitored. The tap may be in the dispenser riser connection or on the vent line, and shall be accessible for connection to a pressure gauge. One tap is adequate for manifolded systems. The tap shall remain plugged and vapor tight except when test equipment is being connected to or removed from it. The system shall not be allowed to operate when the taps are not vapor tight. If located on the vent line, the tap shall be at least six feet (6') and not more than eight feet (8') above grade. A high-quality quick-connect fitting with a vapor-tight cap may be installed instead of a plug if specified by the district.
2. The Phase I system shall be a CARB-certified system which is in good working order and which demonstrates compliance with the static pressure decay test criteria contained in Exhibit 3 of this Order when tested with all fill caps removed. Coaxial Phase I systems shall not be used with new installations of the system. Replacement of storage tanks at existing facilities, or modifications which cause the installation of new or replacement Phase I vapor recovery equipment, are considered new installations with regard to this prohibition. An exception to this prohibition may be made for coaxial Phase I systems CARB-certified after January 1, 1994, as compatible for use with Phase II systems which require pressure/vacuum vent valves.

Where installation of the OPW VaporEZ system is made by retrofitting previously installed equipment, local districts may elect to allow existing coaxial Phase I systems to remain in use for a specifically identified period of time provided the following conditions are met:

- the existing coaxial Phase I system is a poppeted, CARB-certified system; and
 - installation of the Phase II system requires no modification of the UST(s) and/or connections.
3. Spill containment manholes which have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation. Manholes with cover-actuated drain valves shall not be used in new installations (as defined above). Manholes with cover-actuated drain valves may remain in use in facilities where installation of the OPW VaporEZ system does not require modification of the tank fittings provided the facility demonstrates compliance with static pressure decay test criteria both with the cover open and with the cover closed.
 4. The Phase I vapor recovery system shall be operated during product deliveries so as to minimize the loss of vapors from the facility storage tank which may be under pressure. There shall be no less than one vapor return hose connected for each product being delivered. Provided it is not in conflict with established safety procedures, this may be accomplished in the following manner:
 - the Phase I vapor return hose is connected to the delivery tank and to the delivery elbow before the elbow is connected to the facility storage tank;

- the delivery tank is opened only after all vapor connections have been made, and is closed before connection of any vapor return hoses;
 - the existing coaxial Phase I equipment is in good working order and has demonstrated compliance with static pressure decay test criteria when tested with all fill caps removed; and
 - the vapor return hose is disconnected from the facility storage tank before it is disconnected from the delivery tank.
5. Phase I deliveries shall be accomplished so as to ensure that there is at least one vapor connection between the cargo tank compartment headspace and the storage tank associated with the product delivery. There shall be no more than two product hoses used with one vapor hose connected, and no more than three product hoses used with two vapor hoses connected.
6. Storage tank vent pipes, and fill and vapor and manhole tops, shall be maintained white, silver or beige. Colors which will similarly prevent heating of the system due to solar gain may also be used, provided they are listed in EPA AP-42 as having a factor the same as or better than that of the colors listed above. Existing facilities which were installed before April 1, 1996, must be in compliance with this requirement no later than January 1, 1998. Manhole covers which are color coded for product identification are exempted from this requirement.